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BOSTON, MA 02109

EXAMINER

LE, MIRANDA

ART UNIT PAPER NUMBER

2177

DATE MAILED: 09/25/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

10/027,195

Applicant(s)

TUNKELANG, DANIEL

Examiner

Miranda Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 40-41 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3-6 6) ☐ Other:

## DETAILED ACTION

### Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

Group I, Claims 1-39, drawn to a method for searching a collection of items, wherein each item in the collection has a set of properties, classified in Class 707, subclass 3.

Group II, Claims 40-41 drawn to a method for applying a matching/clustering algorithm to a collection of items, constructing a graph having edges that correspond to pairs of items, classified in Class 707, subclass 101.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions I, II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, each of the respective inventions has a separate utility as in a system not having the others. See M.P.E.P. § 806.05(d).

3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for the other Groups, restriction for examination purposes as indicated is proper.

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4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Ms. Ayla A. Lari on September 10, 2003, a provisional election was made without traverse to prosecute the invention of claims 1-39. Affirmation of this election must be made by applicant in responding to this Office action. Claims 39-40 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 C.F.R. § 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 C.F.R. § 1.48(b) and by the fee required under 37 C.F.R. § 1.17(h).

### *Specification*

8. The disclosure is objected to because of the following informalities:

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There are some typographical errors in the claims (e.g. "than" should be changed to "then" see page 7, line 11). Please correct all such errors throughout the claims.

Appropriate correction is required.

### *Drawings*

9. The drawings submitted 12/20/01 have been objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons submitted in Form PTO 948.

### *Claim Rejections - 35 USC § 102*

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless:

(e) the invention was described in

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-2, 7-8, 10, 12, 15-22, 31-33, 38-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Wical et al. (US Patent No. 6,038,560).

Wical anticipated independent claims 1, 31, 32, 33, 38, by the following:

**As to claims 1, 33,** Wical teaches "a method for searching a collection of items, wherein each item in the collection has a set of properties, comprising the steps of: obtaining a query

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composed of a first set of one or more properties” at col. 9, line 54 to col. 10, line 35, col. 17, lines 39-61;

“obtaining a result based on applying a distance function to one or more of the items in the collection” at col. 9, line 54 to col. 10, line 35, col. 17, lines 39-61,

“wherein the distance function determines a distance between the query and an item in the collection based on the number of items in the collection that are associated with all of the properties in the intersection of the first set of properties and the set of properties for the item” at col. 9, line 54 to col. 10, line 35, col. 12, lines 18-45, col. 17, lines 39-61.

**As per claim 31**, Wical teaches “a method for analyzing two sets of properties from a plurality of sets of properties, comprising the steps of: determining a set of common properties in the intersection of the two sets of properties” at col. 9, line 54 to col. 10, line 35, col. 17, lines 39-61;

“determining the number of sets of properties from the plurality of sets of properties that include the set of common properties” at col. 9, line 54 to col. 10, line 35, col. 17, lines 39-61;

“assessing the distance between the two sets of properties as a function of the number of sets of properties that include the set of common properties” at col. 9, line 54 to col. 10, line 35, col. 12, lines 18-45, col. 17, lines 39-61.

**As per claim 32**, Wical teaches “a method for analyzing the relationship between two items in a collection of items, wherein each item in the collection is associated with a set of

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properties, comprising the steps of obtaining a set of properties with which the two items are commonly associated” at col. 9, line 54 to col. 10, line 35, col. 17, lines 39-61;

“determining the degree of commonality between the two items as a function of the number of items in the collection that are associated with all of the properties with which the two items are commonly associated” at col. 9, line 54 to col. 10, line 35, col. 12, lines 18-45, col. 17, lines 39-61.

**As per claim 38**, Wical teaches “a computer system for managing data records comprising: an information retrieval subsystem that stores and retrieves data records, each data record being associated with a set of properties” at col. 9, line 54 to col. 10, line 35, col. 17, lines 39-61;

“a similarity search subsystem that receives similarity search queries and processes similarity search queries based on a distance function, a similarity search query being associated with a first set of properties” at col. 9, line 54 to col. 10, line 35, col. 17, lines 39-61;

“wherein the distance function determines a distance between the query and a data record in the collection based on the number of data records in the collection that are associated with all of the properties in the intersection of the first set of properties and the set of properties for the data record” at col. 9, line 54 to col. 10, line 35, col. 12, lines 18-45, col. 17, lines 39-61.

**As per claim 2**, Wical teaches “the step of associating each item in the collection with a set of properties” at col. 12, line 18 to col. 13, line 6.

**As per claim 7**, Wical teaches “the step of returning the result” at col. 26, line 61 to col. 27, line 13, col. 10, lines 36-62, Fig 11 A-1.

**As per claim 8**, Wical teaches “the step of obtaining a query includes the step of mapping a received query to a set of one or more properties” at col. 26, line 61 to col. 27, line 13, col. 12, line 18 to col. 13, line 6, col. 13, lines 45-67, col. 18, lines 33-46, Fig 11 A-1.

**As per claim 10**, Wical teaches “one or more of the properties are related by a partial order, and wherein, if an item is associated with a property, then the item is also associated with all ancestors of that property in the partial order” at col. 12, lines 46-62, Figs. 4-6.

**As per claim 12**, Wical teaches “the properties are grouped into equivalence classes” at col. 10, lines 14-35, col. 11, lines 14-35, col. 13, lines 24-32.

**As per claim 15**, Wical teaches “the query corresponds to a single item in the collection” at col. 15, Table 3.

**As per claim 16**, Wical teaches “the query corresponds to a plurality of items in the collection” at col. 12, lines 17-45, col. 9, lines 54-63, col. 10, lines 5-13.

**As per claim 17**, Wical teaches “the query is independent of the items in the collection” at col. 8, lines 12-38.



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**As per claim 18**, Wical teaches “the step of obtaining a result is constrained to a subcollection of the items in the collection” at col. 8, lines 12-38.

**As per claim 19**, Wical teaches “the subcollection is specified as an expression of properties” at col. 17, lines 39-61, Figs. 4-6.

**As per claim 20**, Wical teaches “the expression includes a subset of the set of properties that compose the query” at col. 18, lines 33-46, col. 18, line 65 to col. 19, line 67.

**As per claim 21**, Wical teaches “the step of obtaining a query includes identifying certain properties to be ignored in the step of obtaining a result” at col. 8, lines 12-38.

**As per claim 22**, Wical teaches “the distance function is applied explicitly” at col. 12, lines 17-45.

**As per claim 39**, Wical teaches “a clustering subsystem that employs the distance function of the similarity search subsystem to construct a graph” see Fig. 9B.

### **Claim Rejections - 35 USC § 103**

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 3-6, 11, 13-14, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wical et al. (US Patent No. 6,038,560), in view of Tso et al. (US Patent No. 6,385,602).

As per claim 3, Wical does not expressly teach "the step of obtaining a result includes identifying result items whose distance from the query is within a first threshold". However, Tso teaches this limitation at col. 4, line 63 to col. 4, line 20.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical with the teachings of Tso to include "the step of obtaining a result includes identifying result items whose distance from the query is within a first threshold" in order to provide an approach for presenting search results using dynamic categorization so that a large number of search results can be presented to a user in an organized manner without the loss of information.

As per claim 4, Tso teaches "the step of obtaining a result includes ranking the result items according to their distance from the query" at col. 17, lines 3-26, col. 26, line 61 to col. 27, line 13, Fig. 11A-1.

**As per claim 5**, Tso teaches “the threshold is defined as a number of result items” at col. 4, line 63 to col. 5, line 20.

**As per claim 6**, Tso teaches “the threshold is defined as a distance” at col. 4, line 63 to col. 5, line 20.

**As per claim 11**, Wical teaches “one or more of the properties represent numerical values or ranges, and wherein the partial order reflects a set of containment relationships among the numerical values or ranges” at col. 12, line 18 to col. 13, line 32, col. 17, line 3-26, Figs. 4-6.

**As per claim 13**, Wical does not explicitly teach “the step of grouping the properties into equivalence classes using clustering”. However, Tso teaches this limitation at col. 4, lines 42-55.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical with the teachings of Tso to include “the step of grouping the properties into equivalence classes using clustering” in order to provide an approach for presenting search results using dynamic categorization so that a large number of search results can be presented to a user in an organized manner without the loss of information.

**As per claim 14**, Wical teaches “each property has a set of subproperties, wherein the clustering is performed such that the distance between two properties in the collection is correlated to the number of properties in the collection that are associated with all of the

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subproperties common to both properties” at col. 11, lines 14-67, col. 12, line 1 to col. 13, line 6, Figs. 4-6.

**As per claim 34**, Tso teaches “the instructions cause the computer to obtain a result by identifying exactly the items whose distance from the query is within a threshold” at col. 4, line 63 to col. 4, line 20.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical with the teachings of Tso to include “the instructions cause the computer to obtain a result by identifying exactly the items whose distance from the query is within a threshold” in order to provide an approach for presenting search results using dynamic categorization so that a large number of search results can be presented to a user in an organized manner without the loss of information.

14. Claims 9, 23, 26, 28-30, 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wical et al. (US Patent No. 6,038,560), in view of Herz et al. (US Patent No. 6,029,195).

**As per claim 9**, Wical does not specifically teach “one or more of the properties are binary”. However, Herz teaches this limitation at col. 14, lines 19-67.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical with the teachings of Herz to include “one or more of the properties are binary” in order to enable a user to access information of relevance and interest to the user without requiring the user to expend an excessive amount of time and energy.

As per claim 23, Wical does not expressly teach “the distance function is applied implicitly”. However, Herz teaches this limitation at col. 22, lines 1-13.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical with the teachings of Herz to include “the distance function is applied implicitly” in order to enable a user to access information of relevance and interest to the user without requiring the user to expend an excessive amount of time and energy.

As per claim 26, Wical teaches “the step of obtaining a result includes iterating through one or more subsets of the query and identifying items associated with the one or more subsets” at col. 9, lines 34-64.

As per claim 28, Wical does not expressly teach “the step of obtaining a result includes applying a Euclidean distance function”. However, Herz teaches this limitation at col. 16, lines 1-19.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical with the teachings of Herz to include “the step of obtaining a result includes applying a Euclidean distance function” in order to enable a user to access information of relevance and interest to the user without requiring the user to expend an excessive amount of time and energy.

**As per claim 29**, Herz teaches “the step of obtaining a result includes merging a first result determined by applying the distance function and a second result determined by applying the Euclidean distance function” at col. 15, line 44 to col. 16, line 19.

**As per claim 30**, Herz teaches “the step of obtaining a result includes determining a first result by applying either the distance function or the Euclidean distance function and applying the other distance function to the first result” at col. 16, lines 1-19, col. 22, lines 1-13.

**As per claim 35**, Wical does not expressly teach “the instructions cause the computer to obtain a result by identifying approximately the items whose distance from the query is within a threshold according to a heuristic”. However, Herz teaches this limitation at col. 20, lines 1-22.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical with the teachings of Herz to include “the instructions cause the computer to obtain a result by identifying approximately the items whose distance from the query is within a threshold according to a heuristic” in order to enable a user to access information of relevance and interest to the user without requiring the user to expend an excessive amount of time and energy.

**As per claim 36**, Herz teaches “the heuristic permits a trade-off between the accuracy and the performance of a search” at col. 20, lines 1-22.

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15. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wical et al. (US Patent No. 6,038,560), in view of Herz et al. (US Patent No. 6,029,195), and further in view of Tso et al. (US Patent No. 6,385,602).

As per claim 27, Wical and Herz do not explicitly teach “the one or more subsets are prioritized according to the number of items in the collection that have all of the properties in each subset and wherein iterating through one or more subsets of the query is continued until a first threshold is reached”. However, Tso teaches this limitation at col. 4, line 63 to col. 5, line 20.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical, Herz with the teachings of Tso to include “the one or more subsets are prioritized according to the number of items in the collection that have all of the properties in each subset and wherein iterating through one or more subsets of the query is continued until a first threshold is reached” in order to provide an approach for presenting search results using dynamic categorization so that a large number of search results can be presented to a user in an organized manner without the loss of information.

16. Claims 24-25, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wical et al. (US Patent No. 6,038,560), in view of Herz et al. (US Patent No. 6,029,195), and further in view of Cohen et al. (US Patent No. 5,950,189).

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As per claim 24, Wical, Herz do not specifically teach “the step of obtaining a result includes the step of iterating a random walk process to select potential result items”. However, Cohen teaches this limitation at col. 5, line 28 to col. 6, line 67.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wical, Herz with the teachings of Cohen to include “the step of obtaining a result includes the step of iterating a random walk process to select potential result items” in order to allow retrieval and recognition task to be carried out on a physically smaller set of database storage information, and processor computation, including floating point is reduced.

As per claim 25, Wical teaches “the step of obtaining a result includes ranking the potential result items by frequency and selecting the potential result items having higher frequencies” see Fig. 11 A-1.

As per claim 37, Wical, Herz do not specifically teach “the heuristic includes the use of a random walk process”. However, Cohen teaches this limitation at col. 5, line 28 to col. 6, line 67.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of of Wical, Herz with the teachings of Cohen to include “the heuristic includes the use of a random walk process” in order to allow retrieval and recognition task to be carried out on a physically smaller set of database storage information, and processor computation, including floating point is reduced.



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### Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (703) 305-3203. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene, can be reached on (703) 305-9790. The fax number to this Art Unit is (703) 746-7238. The TC 2100's Customer Service number is (703) 306-5631.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.



Miranda Le  
September 19, 2003



GRETA ROBINSON  
PRIMARY EXAMINER